This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1(currently amended). An electric field emission device having a triode structure fabricated by using an anodic oxidation process, comprising:

a supporting substrate;

a bottom electrode layer formed on the supporting substrate, which is used as a cathode electrode of the device;

a gate insulating layer formed on the bottom electrode layer, the gate insulating layer having a plurality of first sub-micro holes to be used as gate holes of the device;

a gate electrode layer formed on the gate insulating layer, the gate electrode layer having a plurality of second sub-micro holes each connecting to a corresponding one of the first sub-micro holes;

an alumina layer formed on the gate electrode layer, the alumina layer having a plurality of third sub-micro holes each connecting to a corresponding one of the second sub-micro holes, wherein the alumina layer and the plurality of third sub-micro holes are formed by the anodic oxidation process;

a top electrode layer for hermetically sealing the device in a vacuum, which is formed on the alumina layer and used as an anode of the device, wherein the top electrode layer is formed by depositing metal in a vacuum by employing one of electron beam deposition, thermal deposition, sputtering, low pressure chemical vapor deposition, sol-gel composition, electroplating and electoless plating; and

a plurality of emitters for emitting electrons in a high electric field, each of the emitters being formed in a corresponding one of the first sub-micro holes.

2(original). The device of claim 1, wherein the emitter contains metal, semiconductor or carbon material.

3(previously presented). The device of claim 2, wherein the carbon material is selected from a group consisting of a carbon nano-fiber, a carbon nano-tube, a carbon nano-particle and amorphous carbon material.

4(previously presented). The device of claim 1, further comprising a resistive layer formed between the bottom electrode layer and the gate insulating layer.

5(original). The device of claim 4, wherein the resistive layer contains SiO_2 or metallic oxide.

6(currently amended). An electric field emission device having a triode structure fabricated by using an anodic oxidation process, comprising:

a supporting substrate;

a bottom electrode layer formed on the supporting substrate, which is used as a cathode electrode of the device;

a gate insulating layer formed on the bottom electrode layer, having a plurality of first sub-micro holes to be used as gate holes of the device;

a gate electrode layer formed on the gate insulating layer, the gate electrode layer having a plurality of second sub-micro holes each connecting to a corresponding one of the first sub-micro holes;

an anode insulating layer formed on the gate electrode layer, having a plurality of third sub-micro holes each connecting to a corresponding one of the second sub-micro holes, wherein the anode insulating layer is formed by performing one of electron beam deposition, thermal deposition, sputtering, low pressure chemical vapor deposition, sol-gel composition, electroplating and electroless plating;

a top electrode layer for hermetically sealing the device in a vacuum, which is formed on the anode insulating layer and used as an anode of the device, wherein the top electrode layer is formed by depositing metal in a vacuum by employing one of

electron beam deposition, thermal deposition, sputtering, low pressure chemical vapor deposition, sol-gel composition, electroplating and electoless plating; and

a plurality of emitters for emitting electrons in a high electric field, each of the emitters being formed in a corresponding one of the first sub-micro holes.

7(original). The device of claim 6, wherein the emitter contains metal, semiconductor or carbon material.

8(original). The device of claim 7, wherein the carbon material is selected from a group consisting a carbon nano-fiber, a carbon nano-tube, a carbon nano-particle and amorphous carbon material.

9(original). The device of claim 6, further comprising a resistive layer formed between the bottom electrode layer and the gate insulating layer;

10(original). The device of claim 9, wherein the resistive layer contains SiO_2 or metallic oxide.

11(previously presented). A method for fabricating an electric field emission device having a triode structure by using an anodic oxidation process, comprising the steps of:

(a) forming a bottom electrode layer on a supporting substrate, the bottom electrode layer being used as a cathode electrode of the device;

(b) forming sequentially a gate insulating layer, a gate electrode layer and an aluminum layer on the bottom electrode layer;

(c) forming a plurality of first sub-micro holes in an alumina layer by performing an anodic oxidation process on the aluminum layer, thereby transforming the aluminum layer into the alumina layer;

(d) etching a barrier layer of the alumina layer and the gate electrode layer,

thereby a surface of the gate insulating layer being exposed through the first sub-micro holes;

(e) forming a plurality of second sub-micro holes in the gate insulating layer, thereby each of the first sub-micro holes connecting to a corresponding one of the second sub-micro holes;

(f) forming an emitter for emitting electron in a high electric field in each of the second sub-micro holes; and

(g) forming a top electrode layer for hermetically sealing the device on the alumina layer in a vacuum, the top electrode layer being used as an anode of the device.

12(original). The method of claim 11, wherein, in the step (c), the anodic oxidation process is performed by using an electrolyte selected from a group consisting of oxalic acid, sulfuric acid, phosphoric acid and chromic acid.

13(original). The method of claim 11, wherein, in the step (d), the barrier layer of the alumina layer and the gate electrode layer are etched by using one of ion milling, dry etching and wet etching techniques.

14(original). The method of claim 11, wherein, in the step (e), the gate insulating layer is etched by using one of ion milling, dry etching, wet etching and anodic oxidation techniques.

15(original). The method of claim 11, wherein, in the step (f), each of the emitters is formed by growing metal from a bottom of each of the second sub-micro holes.

16(original). The method of claim 15, wherein the metal is grown by applying DC or AC voltage (or current) or voltage (or current) pulse to a solution of metal sulfate, metal nitrate or metal chloride.

17(original). The method of claim 15, wherein the metal is grown by using a solution of metal sulfate, metal nitrate or metal chloride after chemically activating a surface of the bottom.

18(original). The method of claim 11, wherein, in the step (f), each of the emitters is formed by attaching metal to a bottom of each of the second sub-micro holes.

19(original). The method of claim 11, wherein, in the step (f), each of the emitters is formed by forming a carbon nano-structure on a bottom of each of the second sub-micro holes.

20(original). The method of claim 19, wherein the carbon nano-structure is one of carbon nano-tube, carbon nano-fiber, amorphous carbon and carbon nano-particle, which are composed by using a thermal decomposition.

21(original). The method of claim 20, wherein the thermal decomposition is performed by thermally decomposing a gas mixture of hydrocarbon, carbon monoxide and hydrogen at 200-800°C.

22(previously presented). The method of claim 19, wherein the carbon nano-structure is one of carbon nano-tube, carbon nano-fiber, amorphous carbon and carbon nano-particle, which are composed by using a plasma decomposition.

23(original). The method of claim 11, wherein, in the step (f), each of the emitters is formed by thiolizing a pre-synthesized carbon nano-tube and applying thereto an Au-S chemical composition process.

24(original). The method of claim 11, wherein, in the step (f), each of the emitters

is formed by performing an electrodephoresis process on a pre-synthesized carbon nano-structure.

25(original). The method of claim 11, wherein, in the step (f), more than one emitter is formed in each of the second sub-micro holes.

26(previously presented). A method for fabricating an electric field emission device having a triode structure by using an anodic oxidation process, comprising the steps of:

(a) forming a bottom electrode layer on a supporting substrate, the bottom electrode layer being used as a cathode electrode of the device;

(b) forming sequentially a gate insulating layer, a gate electrode layer, an anode insulating layer and an aluminum layer on the bottom electrode layer;

(c) forming a plurality of first sub-micro holes in an alumina layer by performing an anodic oxidation process on the aluminum layer, thereby transforming the aluminum layer into the alumina layer;

(d) etching an barrier layer of the alumina layer, the anode insulating layer and the gate electrode layer, thereby a surface of the gate insulating layer being exposed through the first sub-micro holes;

(e) forming a plurality of second sub-micro holes in the gate insulating layer, thereby each of the first sub-micro holes connecting to a corresponding one of the second sub-micro holes;

(f) removing the alumina layer;

(g) forming an emitter for emitting electron in a high electric field in each of the second sub-micro holes; and

(h) forming a top electrode layer for hermetically sealing the device on the anode insulating layer in a vacuum, the top electrode layer being used as an anode of the device.

27(original). The method of claim 26, wherein, in the step (c), the anodic oxidation process is performed by using an electrolyte selected from a group consisting of oxalic acid, sulfuric acid, phosphoric acid and chromic acid.

28(original). The method of claim 26, wherein, in the step (f), the alumina layer is removed by dipping the alumina layer in a solution of phosphoric acid or a mixed solution of phosphoric acid and chromic acid.

29(original). The method of claim 26, wherein, in the step (g), each of the emitters is formed by growing metal from a bottom of each of the second sub-micro holes.

30(original). The method of claim 29, wherein the metal is grown by applying DC or AC voltage (or current) or voltage (or current) pulse to a solution of metal sulfate, metal nitrate or metal chloride.

31(original). The method of claim 29, wherein the metal is grown by using a solution of metal sulfate, metal nitrate or metal chloride after chemically activating a surface of the bottom.

32(original). The method of claim 26, wherein, in the step (g), each of the emitters is formed by attaching metal to a bottom of each of the second sub-micro holes.

33(original). The method of claim 26, wherein, in the step (g), each of the emitters is formed by forming a carbon nano-structure on a bottom of each of the second sub-micro holes.

34(original). The method of claim 33, wherein the carbon nano-structure is one

of carbon nano-tube, carbon nano-fiber, amorphous carbon and carbon nano-particle, which are composed by using a thermal decomposition.

35(currently amended). The method of claim 34, wherein the thermal decomposition is performed by thermally decomposing a gas mixture of hydrocarbon, carbon monoxide and hydrogen at 200-800~~OL176\f"Symbol"\s12~~°C.

36(previously presented). The method of claim 33, wherein the carbon nano-structure is one of carbon nano-tube, carbon nano-fiber, amorphous carbon and carbon nano-particle, which are composed by using a plasma decomposition.

37(original). The method of claim 26, wherein, in the step (g), each of the emitters is formed by thiolizing a pre-synthesized carbon nano-tube and applying thereto an Au-S chemical composition process.

38(original). The method of claim 26, wherein, in the step (g), each of the emitters is formed by performing an electrodephoresis process on a pre-synthesized carbon nano-structure.

39(original). The method of claim 26, wherein, in the step (g), more than one emitter is formed in each of the second sub-micro holes.